

Metabolic profiling by hydrophilic interaction ultra-performance liquid chromatography time-of-flight mass spectrometry in the study of chronic kidney disease

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Chronic kidney disease (CKD) is a devastating illness characterized by the accumulation of uremic retention solutes in the body. Current biomarkers, such as serum creatinine or urinary albumin, lack the sensitivity for early detection of CKD, which is primordial towards disease management. Therefore, there is a clear need for novel biomarkers.

Contributing to the quest for better CKD biomarkers, a plasma based hydrophilic interaction ultra-performance liquid chromatography time-of-flight mass spectrometric (HILIC-UPLC-TOF MS) platform was developed, providing complementary information to reversed-phase (RP) chromatography. Plasma samples from CKD patients at stage 3 (n=20), at stage 5 (n=20) and from healthy controls (n=20) were monitored in both positive and negative electrospray ionization mode. The validity of the metabolomics dataset was ensured by quality control (QC) samples. Data were treated with XCMS followed by multivariate statistical analysis.

Differentiation was achieved between the metabolic profile of the CKD patients and healthy controls. In addition, new potential biomarkers were revealed.

Targeted methods will be developed to validate these biomarker candidates in an extended study population.